I. COVER SHEET

1999 CALFED ECOSYSTEM RESTORATION PROPOSAL SOLICITATION

Proposal Title:	Tuolumne River Sediment Management and Implementation Plan			
Applicant Name:	Turlock Irrigation District/Tuolumne River Technical Advisory Committee			
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Email:	wbfryer@TID.ORG	- -		
Amount of funding re	equested: \$411,400 for	three years.		
Indicate the Topic fo important decision:	r which you are applyir	g (check only one box). Note that this is an		
☐ Fish Passage/Fish	Screens	☐ Introduced Species		
☑ Habitat Restorati	on	☐ Fish Management/Hatchery		
☐ Local Watershed :		☐ Environmental Education		
☐ Waters Quality				
-	dress a specific Focuse			
Indicate the geograph	nic area of your proposa	al (check one box only):		
☐ Sacramento River Mainstem		☐ East Side Trib:		
☐ Sacramento Trib:		☐ Suisun Marsh and Bay:		
☐ San Joaquin River Mainstem		☐ North Bay/South Bay:		
☑ San Joaquin Trib: <u>TUOLUMNE RIVER</u> ☐ Landscape (entire Bay-Delta watershed) ☐ Delta: ☐ Other:				
☑ San Joaquin and	East-side Delta tributar	osal addresses (check no more than two boxes):		
☐ Winter-run chinoc		☐ Spring-run chinook salmon		
☐ Late-fall run chine	ook salmon	☐ Fall-run chinook salmon		
☐ Delta smelt		☐ Longfin smelt		
☐ Splittail		☐ Steelhead trout		
☐ Green sturgeon		Striped bass		
☐ Migratory birds		☐ All chinook species		
☐ Other		☐ All anadromous species		
•				

Specify the ERP strategic objective and target (s) that the project addresses. Include page numbers from the January 1999 version of ERP Volume I and II:

This project will address a necessary step to achieving the ERP vision for the Tuolumne River Ecological Management Unit (ERP Vol. II, page 417), including greater sediment supply, improved foodweb productivity, and improved habitat. The project will help restore and reactivate the ecological processes that create and maintain habitats for anadromous salmonids, while reducing the effects of a major stressor-dams.

Indicate the type of applicant (check only one	box):
☐ State agency ☐ Public/Non-profit joint venture ☑ Local government/district ☐ University	☐ Federal agency ☐ Non-profit ☐ Private party ☐ Other:
Indicate the type of project (check only one bo	x):
☐ Planning ☐ Monitoring ☐ Research	☑ Implementation ☐ Education

By signing below, the applicant declares the following:

- 1) The truthfulness of all representations in their proposal;
- 2) The individual signing the form is entitled to submit the application on behalf of the applicant (if applicant is an entity or organization); and
- 3) The person submitting the application has read and understood the conflict of interest and confidentially discussion in the PSP (Section II.K) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

(Printed name of applicant)

(Signature of Applicant)

II. TITLE PAGE

TUOLUMNE RIVER SEDIMENT MANAGEMENT AND IMPLEMENTATION PLAN

A Proposal Submitted by:

Agency

Turlock Irrigation District

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Type of Organization: Irrigation District
Tax status Tax Exempt

Participants and Collaborators. This proposal is prepared and submitted by the Turlock Irrigation District on behalf of the Tuolumne River Technical Advisory Committee (TRTAC). The TRTAC is composed of the signatories of the New Don Pedro Proceedings 1995 FERC Settlement Agreement, and include the Turlock and Modesto Irrigation Districts (TID/MID), the City and County of San Francisco (CCSF), the Bay Area Water Users Association (BAWUA), resource agencies including CA Department of Fish and Game (CDFG), and US Fish and Wildlife Service (USFWS), and environmental organizations including the Tuolumne River Preservation Trust (TRPT), and Friends of the Tuolumne (FOTT).

III. EXECUTIVE SUMMARY

Project Description. The purpose of this project is to develop and implement a comprehensive sediment management plan (Sediment Plan) for the 23 mile alluvial reach of the Tuolumne River between La Grange Dam (RM 52) and Waterford (RM 47.5) (Figure 1) that can also be used to develop methodologies to be applied to the remaining 15 miles of spawning habitat on the river. A general strategy for sediment management was presented in the Draft Tuolumne River Corridor Habitat Restoration Plan. Four critical tasks for restoring and maintaining a balanced sediment budget in the gravel-bedded reach were identified.: (1) greatly increase coarse sediment storage in the channel with a large "transfusion" of coarse sediment to provide alluvial deposits immediately available for chinook salmon spawning, and for eventual downstream transport and redeposition; (2) maintain this restored coarse sediment storage by periodic augmentation of coarse sediment supply equal to the rate of downstream sediment transport; (3) implement remedial actions to prevent further extensive fine sediment input into the Tuolumne River from Gasburg Creek (located near upstream end of the spawning reaches); and (4) implement actions to reduce fine sediment storage in the mainstem Tuolumne River.

The Tuolumne River Technical Advisory Committee (TRTAC) has developed this strategy into an implementation framework for sediment management. This framework, presented in Figure 2, summarizes tasks to be implemented by this (TID/TRTAC) proposal, and by specific CDFG proposals. This framework presents four tasks that provide the scope of work for this project:

- Task 1 will develop a sediment management and implementation plan that includes design, implementation, adaptive management, and the monitoring required for adaptive management. Task 1 also includes refinement of a chinook salmon juvenile production model developed by TID & MID that can be used to predict the benefits of sediment management on salmon production.
- Task 2 will initiate a program for coarse sediment augmentation, including refinement of proposed introduction sites, introduction volumes, and monitoring protocols that were originally developed for the Restoration Plan.
- Task 3 will initiate a program for fine sediment reduction, by: (1) greatly reducing fine sediment supplied to the upper river from the Gasburg Creek watershed, (2) evaluating alternative methods for fine sediment reduction/removal in the mainstem Tuolumne River, and (3) implementing fine sediment removal from the mainstem channel.
- Task 4 will develop an adaptive management and monitoring program for quantifying coarse sediment transport to provide volume estimates for annual augmentation to maintain coarse sediment storage in the mainstem channel. This task will also initiate and/or complete several monitoring protocols for evaluating spawning habitat quantity, quality, and use by spawning salmon.

Project Location. The project is located in the 23 -mile long alluvial reach downstream of La Grange Dam on the Tuolumne River in Stanislaus County approximately 20 miles east of Modesto.

The primary biological/ecological benefits of the project are increased coarse sediment in the spawning reach and reduced fine sediment in the mainstern channel. Coarse sediment will be available for immediate use as chinook spawning habitat and for transport and re-deposition at

high flows. Combined with high flows, sediment management will allow revitalization of geomorphic processes that create and maintain a healthy ecosystem and high quality habitat for native aquatic and riparian species.

Project cost is \$411,400.

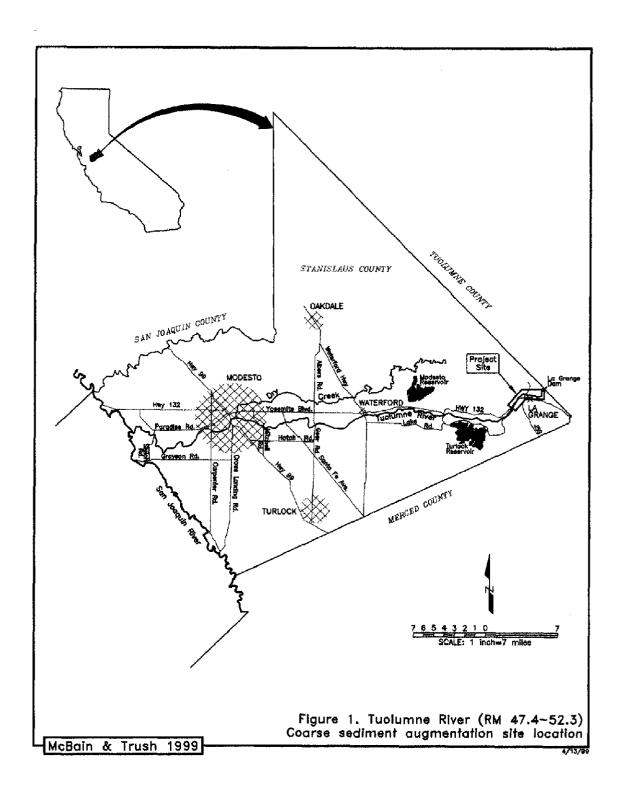
There are no adverse or third party impacts identified in this project proposal.

Application Qualifications. This proposal was prepared and submitted by the Turlock Irrigation District on behalf of the Tuolumne River Technical Advisory Committee (TRTAC). The TRTAC is responsible for preparing and implementing a river-wide restoration plan and specific restoration projects on the Tuolumne River. TID is currently administering several TRTAC sponsored restoration projects on the Tuolumne River, and will administer the Sediment Management and Implementation Plan. The Program Manager and principal contact for this project is Wilton Fryer, P.E.

Monitoring and data evaluation. Adaptive management and monitoring is an integral component of this project, for both coarse sediment augmentation and fine sediment reduction. Monitoring results will provide estimates of coarse sediment export as a function of discharge, which will allow managers to predict how much coarse gravel to introduce to maintain alluvial deposits. Other monitoring tasks will assess the biological benefits of fine sediment reduction, utilizing a chinook salmon juvenile production model, conduct permeability and fry emergence studies, and other empirical assessments of chinook salmon habitat.

Local support. The project is a product of efforts of the TRTAC, and has their support and participation for technical supervision. The TRTAC has prepared a conceptual version of the *Tuolumne River Corridor Habitat Restoration Plan* for presentation to the public, and will be convening several public workshop and outreach meetings to share information and seek input from the public. One workshop was held in December 1998 with the Stanislaus County Planning Division and the City of Modesto Planning Department. Much of the property within the upper portions of the project boundary is owned by Stanislaus County and they have been informed by letter of the activities of this project.

Compatibility with CALFED objectives. This project addresses Goal 2 of the CALFED Strategic Plan for Ecosystem Restoration (Table 5-1) specifically recommending restoring "coarse sediment supplies to sediment-starved rivers downstream of reservoirs." The project also addresses the vision for the Tuolumne River Ecological Management unit of "restoring more natural channel configurations; restoring gravel recruitment, transport, and cleansing processes; and restoring a balanced fine sediment budget" (ERPP Vol. II, p.419). The project will also help CALFED achieve the objective of developing a sediment management demonstration program on one of the three designated demonstration rivers, and provide the framework for sediment management as well as other methods/techniques that can be applied to other Central Valley river ecosystems.



IV. PROJECT DESCRIPTION

A. Proposed Scope of Work

Project approach:

This project will implement one of the recommendations in the *Draft Tuolumne River Corridor Habitat Restoration Plan* (McBain & Trush 1998) by developing and implementing a comprehensive sediment management plan (Sediment Plan) for the Tuolumne River. The Restoration Plan recommended a four-phased strategy for managing coarse and fine sediment: (1) restore coarse sediment storage in the channel with a large "transfusion" of cobbles and gravels to recreate riffles and gravel bars, providing immediate habitat for chinook salmon spawning, and for eventual downstream transport and deposition; (2) maintain this coarse sediment storage by periodic coarse sediment augmentation (re-create supply) at a rate equal to the rate of downstream transport; (3) implement remedial actions to prevent further extensive fine sediment input into the Tuolumne River from Gasburg Creek (located at the upstream end of the spawning reaches), and (4) once this fine sediment source is treated, implement actions to reduce fine sediment storage in the mainstem Tuolumne River.

From this basic strategy, the Tuolumne River Technical Advisory Committee (TRTAC) has developed a conceptual framework for implementing sediment management (Figure 2). Several tasks within this framework will be implemented by the California Department of Fish and Game (CDFG), either through projects already funded or through a specific proposal submitted to CALFED requesting FY1999 funding. Other tasks will be implemented by consultants, with TID project administration and TRTAC technical supervision. This arrangement is similar to several ongoing restoration and monitoring projects on the Tuolumne River, and assures the most timely and efficient implementation of the proposed tasks while utilizing the technical expertise of TRTAC participants. Additionally, this framework and implementation strategy is consistent with other efforts to restore the Tuolumne River.

Task 1. Develop a Tuolumne River Sediment Management Plan.

Task 1 will consist of turning the sediment management strategy recommended in the Restoration Plan into a sediment management plan that includes design, implementation, adaptive management, and the monitoring required for adaptive management. Task 1 will include:

- 1a. Develop a sediment management and monitoring plan. The plan will be presented in a report that will summarize all components that are necessary to implement coarse sediment augmentation and fine sediment reduction, including descriptions of coarse sediment augmentation sites and volumes, identifying mainstem fine sediment storage sites, and outlining a strategy for assessing fine sediment storage reduction methodologies (i.e., riffle ripping, flushing, suction dredging, riffle replacement, gravel cleaning machine). Overall project management by TID will be included in this task.
- 1b. Refine the incubation component of the juvenile production EACH model developed by TID/MID (EA 1992) to predict benefits to chinook salmon fry production resulting from sediment management efforts (this will aid the evaluation of Task 4b).

Task 2. Coarse Sediment Management (Augmentation)

Task 2 will refine coarse sediment augmentation recommendations, including: proposed introduction sites, introduction volumes, and monitoring protocols that were originally developed

for the Restoration Plan. The Restoration Plan initially identified initial gravel introduction sites, provided preliminary estimates of gravel volumes needed at each site, prioritized sites, and suggested specific methods for gravel placement in the stream, based on reconnaissance level surveys. Coarse sediment introduction sites and volumes require additional field verification and surveying to assist CDFG with implementing the coarse sediment introduction phases under their CALFED proposals.. Task 2 includes:

- 2a. Identify additional coarse sediment introduction sites and re-evaluate initial introduction site priorities.
- 2b. Refine sediment volume estimates at each site with surveyed cross sections and aerial photography (this will also be used as pre-implementation conditions in Task 4).
- 2c. Identify material sources suitability (quantity/quality/haul distance) for use in sediment augmentation.

CALFED has funded CDFG (FY1997) to begin gravel augmentation (Task 2d), and those funds will provide at least 10,000 yd³ of gravel to an upstream site located below La Grange Bridge. CDFG is currently submitting a parallel proposal to CALFED for FY1999 funding to continue the gravel augmentation phase (Task 2b), with augmentation of an additional 10,000 to 20,000 yd³ of gravel. This (TID) proposal does not request funding for the actual gravel augmentation tasks presented in the framework (Tasks 2d – 2f), but only references them as an integral part of the overall sediment management program.

Task 3. Fine Sediment Management (Reduction).

The Restoration Plan recommended a two-phased fine sediment management approach: reducing/eliminating fine sediment input into the mainstem Tuolumne River in the spawning reach, and reducing fine sediment storage in the channel, either by mechanical methods (suction dredging, etc), channel maintenance flows, or other methods. Task 3 would provide this by:

- 3a. Evaluating alternative methods for fine sediment reduction/removal in the mainstem Tuolumne River (e.g., suction dredging, fluvial entrainment) to determine the effectiveness of each method for broader application. This task will also include completing an evaluation of mechanical gravel cleaning techniques initiated by TID/MID in 1991-93 that was not completed. This evaluation will be used in adaptive management by comparing cleaning costs with salmon benefits using the salmon production model developed by TID/MID (see Task 1b).
- 3b. Implementing a mainstem fine sediment reduction program within the spawning reach in the Tuolumne River, based on the findings in task 3a.

CDFG will request funding to decrease fine sediment input from in the Gasburg Creek watershed (Task 3c) in a parallel CALFED FY 1999 proposal, therefore, this proposal does not request funding for this task (Task 3c), but references it as an integral part of the overall sediment management program.

Task 4. Implement Adaptive Management and Monitoring Program.

To implement coarse sediment adaptive management, monitoring must be able to quantitatively estimate volumes of gravel transported within the river. Additionally, the TID/MID salmon production model will be used to predict benefits and evaluate different management techniques. Task 4 includes:

- 4a. Quantify annual sediment augmentation volumes using sediment transport monitoring using: (1) a bedload transport sampling station to measure bedload transport rates during high flows; (2) benchmarked cross section surveys at proposed gravel augmentation sites (established in task 2b); and (3), bed surface particle mobility and subsurface scour evaluations.
- 4b. Quantify the benefits of sediment management to chinook salmon population. Task will apply existing salmon production model in conjunction with empirical studies (habitat mapping of channel planform and adult spawning utilization, egg survival-to-emergence studies,).
- 4c. Integrate data from existing TRTAC program for monitoring permeability and particle size distribution in chinook salmon spawning riffles. This program was initiated in 1998 to establish a correlation between particle size (determined by McNeil samples) and permeability (using standpipes). The program will use permeability for quantitative evaluation of spawning gravel quality.
- 4d. Complete the analysis of photo-documentation of spawning gravel quality in chinook salmon spawning riffles. This pilot study was initiated in 1998 by the TID/MID for assessing gravel quality.
- 4e. Evaluate relationship between egg survival-to-emergence of salmon fry and permeability of spawning gravels with egg-to-emergence monitoring. Permeability monitoring will be implemented in conjunction with TRTAC permeability program for cost-sharing benefits.
 Integrate data from proposed CDFG monitoring of interim sedimentation basin on Gasburg Creek to determine effectiveness of fine sediment trapping efforts.

B. Location and geographic boundaries:

The Tuolumne River is the largest of three major tributaries (the Tuolumne, Merced, and Stanislaus Rivers) of the San Joaquin River and drains about 1,900 square miles of the Sierra Nevada (Figure 1). La Grange Dam is the lowermost dam on the river. The geographic boundary of this proposal covers the entire salmon spawning reach within the 23 miles downstream of La Grange Dam (RM 52 to 29) with a specific focus on the first 5 miles downstream of the dam. Figure 2. Conceptual framework for sediment management and implementation on the Tuolumne River.

Draft Tuolumne River Corridor Restoration Plan



- Task (1): Tuolumne River Sediment Management Plan
- a Revise and prepare a sediment management and monitoring plan (includes project and database management)
- Refine juvenile salmon production model developed by TID (EA 1992) to predict benefits of sediment management efforts.



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Task (2): Coarse Sediment Management (Augmentation)

- a Identify and prioritize coarse sediment introduction sites
- b Estimate sediment volumes required at each site
- c Identify potential material sources and material suitability (quality)
 - Implement CIPO Phase I Gravel Introduction (Funded by CALFED in 1997)
- Complete CEQANDPA and Permiting for La Grange to Busso reach (CDFO CALFED 1999) Proposal)
- Imperient CDFG Phase II Gravet Introduction (CDFG CALFED 1999 Proposal)

Task (3): Fine Sediment Management

Evaluate mainstern fine sediment reduction (gravel cleaning) methodologies

(Reduction)

- b Implement mainstem fine sediment reduction program
- c. Conduct Gesburg Creek identificant watershed remediation, as hidding lower Greekorg Creek regreding and revesetation, Gasburg Creek machine sedimentation point, and Gasburg Creek watershed evaluation.





Task (4): Adaptive Management and Monitoring Program

- a Adaptive Management; quantify annual sediment augmentation volumes
- Adaptive Management: quantify biological benefits of sediment management
- Monitoring: continue permeability and substrate quality monitoring program (Funded by TRTAC in 1998)
- Monitoring: complete gravel photo assessment of substrate quality (Partially funded by TRTAC in 1998)
- Monitoring: develop relationship between egg-emergence and permeability to predict fry emergence success
 Monitoring Gasbing Creek sedimentation begin and

waters had rehabilitation

= tasks implemented within CDFG proposal

Figure 2. Conceptual framework for sediment management and implementation of the Tuolumne River.

V. ECOLOGICAL/BIOLOGICAL BENEFITS

A. Background.

The sediment regime in the lower Tuolumne River corridor has been altered for more than a century, beginning with construction of Wheaton Dam in 1871. Dams eventually eliminated the delivery of coarse sediment from the upper watershed. Gold dredging systematically excavated the river channel and floodplain. In-channel and floodplain sand and gravel mining have further altered the sediment regime. Spawning riffles have been reduced, and fine sediments have accumulated within the spawning gravels.

B. Ecological/Biological Objectives

The goal of this project is to develop and implement a sediment management plan that (1) increases the storage and long-term supply of coarse sediment (gravel) to the mainstem Tuolumne River, and (2) decreases the supply and storage of fine sediment (sand) in the mainstem Tuolumne River. Achieving this goal will provide direct collateral benefits to a broad range of ecosystem components, including dynamic geomorphic processes, chinook salmon, and other native aquatic and riparian species and their habitats. Objectives of the sediment management plan include:

- Increase and maintain spawning and rearing habitat availability for chinook salmon by
 introducing appropriately sized coarse sediment (1/2" to 3") throughout the spawning reach
 between La Grange Dam (RM 52) and RM 29. The initial focus will be in the upper 5 miles
 of the river.
- Improve spawning and rearing habitat quality by introducing coarse sediment that can be transported and redeposited more frequently by the contemporary (and future) flow regime.
- Rehabilitate fluvial processes by improving the river's ability to transport coarse sediment, create and maintain dynamic channel morphology and associated habitat complexity.
 Indicators of this improvement include increased number of exposed gravel bars, a more variable channel width, active floodplain formation, increased channel migration, and bedload routing throughout the reach.
- Reduce fine sediment supply to the Tuolumne River spawning reach from the Gasburg Creek watershed and other sources.
- Reduce fine sediment storage in the Tuolumne River by mechanical removal of sand from spawning riffles and other channel areas.

Need for project: As with nearly all rivers in the Central Valley, dams on the Tuolumne River have eliminated the coarse sediment supply from the upstream watershed. Because much of the habitat in mainstem alluvial rivers is associated with coarse sediment deposits (gravel bars and riffles), supplementing coarse sediment storage below dams is essential to restore these habitats for native aquatic and riparian organisms, including fall-run chinook salmon. Continued lack of sediment supply will result in further degradation of riverine habitats and limit the success and longevity of other restoration projects currently being funded and implemented on the Tuolumne River. Excessive fine sediments are present which are documented to reduce salmon survival.

Basis for expected benefits: Restored coarse sediment supply and reduced fine sediment will significantly improve spawning habitat conditions, including the quantity, quality, and

complexity of habitat, by recreating a more natural sediment regime and allowing geomorphic and ecological processes to function within the river channel and floodplain.

The primary stressors that this project seeks to alleviate include past gold mining impacts, sand and gravel mining, dams, and flow regulation. The primary species targeted by this project is the San Joaquin River Basin fall-run chinook salmon population. The primary habitats include freshwater fish habitat and riparian and riverine habitat.

The primary benefits of this project are: (1) an improved spawning and incubating environment for chinook salmon, (2) a revitalized alluvial channel morphology exhibiting dynamic processes of sediment scour, redeposition and downstream transport, and (2) high quality habitat for specific life stages of native aquatic and riparian species restored and maintained by dynamic alluvial processes. Secondary benefits include improved invertebrate biomass that will contribute to better chinook salmon rearing conditions and overall stream productivity.

Biological and Geomorphic responses to sediment augmentation to be evaluated in this project:

- Coarse sediment augmentation in the spawning reach below La Grange Dam will reduce egg mortality resulting from limited spawning habitat availability and consequent redd superimposition.
- 2. Fine sediment reduction and removal from spawning riffles will increase survival-toemergence of chinook salmon fry by reducing egg and alevin mortality associated with fine sediment infiltration into redds,
- 3. Coarse sediment augmentation and restoration of natural channel morphology of alternate bar sequences will improve rearing conditions for fry and juvenile chinook salmon along newly restored shallow stream margins. Gravel bar margins are dynamic habitats that maintain their suitability for fry and juvenile rearing at varying flow stages, an important component of rearing habitat.
- 4. Fine sediment can be removed from embedded substrates mechanically to thus improve spawning gravel quality.

Following implementation of sediment augmentation, the project will require an adaptive management framework to implement annual or periodic sediment augmentation. Monitoring is essential to the success and durability of this project.

C. Linkages

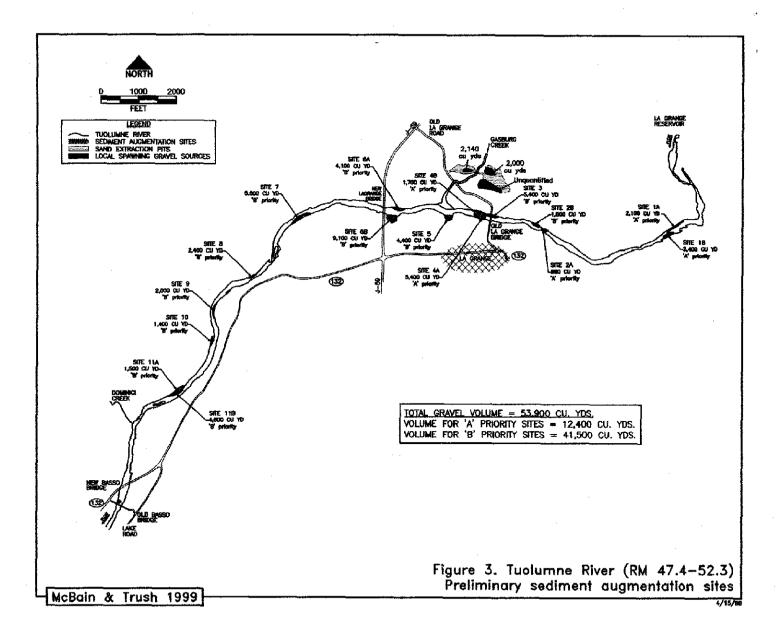
The draft Restoration Plan (McBain & Trush, 1998) provides general recommendations for restoring ecological processes to the Tuolumne River, and includes a framework for sediment management. This proposal will provide a more detailed sediment management plan upon which future sediment management decisions, adaptive management and monitoring will be organized. The coarse sediment augmentation phase implemented by CDFG (Phase I funded by CALFED in 1997, Phase 2 funding requested by CDFG in CALFED FY1999 PSP), and the Gasburg Creek rehabilitation and fine sediment reduction project (funding requested by CDFG in CALFED FY1999 PSP) were all developed within the sediment management strategy recommended in the draft Restoration Plan and the framework contained in this proposal.

Other large-scale restoration projects are currently being implemented on the Tuolumne River with similar ecosystem-based objectives of restoring channel morphology, restoring dynamic fluvial processes, and restoring and maintaining habitat for native species. The sediment management program will aid those projects by providing upstream coarse sediment supplies to spawning areas in. Additionally, gravel cleaning techniques developed within this project can be used to improve fine sediment conditions in the Tuolumne River, and other Central Valley rivers as well.

This project addresses Goal 2 of the CALFED Strategic Plan for Ecosystem Restoration (Table 5-1) specifically recommending restoring "coarse sediment supplies to sediment-starved rivers downstream of reservoirs." The project also addresses the vision for the Tuolumne River Ecological Management unit of "restoring more natural channel configurations; restoring gravel recruitment, transport, and cleansing processes, and restoring a balanced fine sediment budget" (ERPP Vol. II, p.419). The project will also help CALFED achieve the objective of developing a sediment management demonstration program on one of the three designated demonstration rivers, and provide the framework for sediment management as well as other methods/techniques that can be applied to other Central Valley river ecosystems.

D. System-Wide Ecosystem Benefits

System-wide benefits are not limited to the immediate geographical scope of the project, nor to chinook salmon spawning and rearing habitats. An important benefit of coarse sediment augmentation will be to provide one of two essential components necessary to restore geomorphic processes (the other key component being high flows capable of reworking this coarse sediment). An adequate coarse sediment supply is critical for restoring dynamic geomorphic processes in the upper river and restoring the ability of the river to readjust its dimensions. Given high flows exceeding geomorphic thresholds, coarse sediment will route downstream, extending its durability and longevity as habitat as it is transported to successive depositional features.



V. TECHNICAL FEASIBILITY AND TIMING

Alternatives. The goal to restore a coarse sediment supply and balanced sediment budget to the spawning reach will require directly placing substantial amounts of coarse sediment in the channel at several locations. There are no alternative methods that meet the CALFED Strategic Plan Goal #2 (page 27) of rehabilitating natural processes in the Bay-Delta system. Decades of lost sediment supply from upstream dams and mining have eliminated most alluvial storage deposits, and will require an initially large volume of sediment to replace lost supplies. Other methods of improving or rehabilitating specific microhabitat features, such as replacing a particular spawning riffle, have been used in the past, but these techniques are usually short lived. Coarse sediment augmentation is designed to address broader ecosystem-based objectives, including restoring dynamic fluvial processes, improving the quantity and quality of chinook salmon habitat, and providing complex habitat for diverse native fish and wildlife species.

Fine sediment reduction is a more complex issue. Management must consider the entire watershed downstream of New Don Pedro Dam, including tributary and non-point sources, and the volume of fine sediment presently stored in the channel. Remediation of the Gasburg Creek watershed will represent a significant step toward reducing fine sediment entering the Tuolumne River in the upper spawning reach. Methods for reducing fine sediment stored in the channel are limited; developing these methods is the primary purpose of Task 3 of this project.

Environmental compliance. The companion proposal submitted to CALFED by CDFG will request funding to complete the environmental documentation and permitting for the upper reach, including all components of the sediment management framework presented in Figure 2. CDFG has completed the "Proposed Negative Declaration for the La Grange Gravel Addition Salmonid Habitat Improvement Project", and will continue this process for successive phases of that project.

Other constraints. The supply of coarse sediment as source material for sediment augmentation is limited in the Tuolumne River. Materials will be obtained from sources already under extraction permit, or from nearby sources outside the Tuolumne River corridor or Stanislaus County (e.g., Merced River).

VI. MONITORING AND DATA COLLECTION METHODOLOGY

The adaptive management and monitoring program is an integral part of the sediment management plan, and a primary component of the framework presented in Figure 2. Three primary goals of monitoring are:

- 1. Quantify the annual volume of coarse sediment augmentation needed to maintain sediment supplies stored in the channel. We will develop a bedload transport rating curve to help quantify the volume of coarse sediment transported downstream during high flows. Based on previous bedload monitoring experience on the Tuolumne River, we recommend Riffle 4B (RM 48.3) as a monitoring site for establishing a seasonal cableway to provide attachment for a cataraft and Helley-Smith bedload sampling equipment. Bedload transport measurements will be sieved for particle size distribution, and the transport rate of coarse sediment (>1/4 inch) will be related to discharge to develop a coarse sediment transport rating curve.
- 2. Assess the effects of sediment management on the river channel form and geomorphic processes. The Restoration Plan presented the "Attributes of Alluvial Ecosystem Integrity" as quantifiable objectives for restoring and maintaining the ecosystem. The CALFED ERP Vol. II (p.420) suggests the Attributes as a "basis for the Tuolumne River restoration vision... [and]... for selecting actions for CALFED Stage 1 Implementation. Several of these Attributes will be used in monitoring to assess the status of geomorphic processes, including:

Attribute 1: Spatially Complex Channel Shape.

Monitoring will employ habitat mapping techniques using GIS based aerial photographs and field mapping to assess changes in the channel planform, habitat quantity/quality, and habitat use by native and non-native species.

Attribute 3: Frequently mobilized channelbed surface.

Bed-surface mobility will be monitoring by placing painted tracer rocks on riffle and gravel bar cross sections, and measuring the distance they are transported by high flows.

Attribute 4: Periodic channelbed scour and fill:

Subsurface bed scour and deposition will be monitored using scour cores, scour chains or other techniques to quantify the depths of scour and redeposition at several high flow stages.

Attribute 5: Balanced fine and coarse sediment budgets:

In addition to the permanent bedload monitoring station at Riffle 4B, several cross sections will be established at riffles and gravel bar features to determine channel responses to seasonal high flow events.

3 Assess the response of biological resources to changes in habitat conditions. A restored coarse sediment supply (and properly functioning geomorphic attributes) and reduced fine sediment storage will improve habitat conditions for native aquatic, wildlife, and riparian species, including the fall-run chinook salmon population. Monitoring will focus on quantifying spawning habitat use by chinook salmon and improvements in gravel quality permeability that lead to increased survival to emergence of salmon fry.

Table 1. Monitoring and data collection information

Hypthesis/Question to be Evaluated	Monitoring Parameters and Data Collection Approach	Data Evaluation Approach	Comments/Data Priority
What is the volume of coarse sediment transported during high flow events?	Volume (in cubic yards) of sediment transported per unit time; measured with Helley-Smith bedload sampler at seasonal cableway station.	Develop coarse sediment transport rating curve for estimating annual sediment transport volumes.	Bedload sampling station located at Riffle 4B within the primary spawning reach.
Hypothesis: coarse sediment augmentation will increase spatial channel complexity by allowing formation of alluvial deposits and associated microhabitat features.	Aerial phote analysis and field habitat mapping, relating specific microhabitat features (chinook salmon spawning and rearing habitat) to alluvial bar units and other geomorphic features.	Compare time trends in planform change; relate chinook salmon use to specific spatial habitat features.	These techniques are being implemented in other Tuolumne River restoration projects.
Coarse sediment augmentation will lower thresholds for initiation of surface particle mobility.	Painted tracer rocks including the D ₃₁ , D ₅₀ , and D ₈₄ , placed on cross sections across riffles and alluvial deposits, monitored before and after discreet high flow events.	Comparing changes in thresholds over time.	Will depend on getting an adequate range of high flows.
Coarse sediment augmentation can maintain a balanced (or slightly surplus) coarse sediment budget	Sediment transport measurements to quantify transport rates and cross sections through alluvial deposits to document changes in coarse sediment storage.	Compare estimates of sediment transport to volumes of annual sediment augmentation to determine net change.	Initial phases of sediment augmentation will store coarse sediment supplies until alluvial storage deposits are saturated.
The decreased particle size distribution of introduced coarse sediment will improve geomorphic processes under the post-NDPP flow regime.	Tracer gravels and scour cores to measure bed mobility and bed scour thresholds as a function of discharge.	Compare thresholds with nearby control sites.	Initial control sites will be downstream of the Basso Bridge.
The volume of fine sediment stored in the channel bed will be reduced with treatments in Gasburg Creek watershed.	Permeability and bulk sediment sampling to determine sediment composition of bed substrates.	Compare trends over time.	Gravel quality monitoring is currently funded by TRTAC river- wide monitoring program.
Fine sediment can be economically removed from in-channel storage by mechanical methods or other methods.	Complete analysis and report on feasibility and efficacy of different fine sediment removal methodologies	Evaluation of costs and the relative efficacy of different techniques.	Date collected in 1991– 93

VII. LOCAL INVOLVEMENT

The primary group involved with conceptual development and implementation of this project is the Tuolumne River Technical Advisory Committee (TRTAC). Involvement is primarily by the Turlock and Modesto Irrigation Districts (TID/MID), City and County of San Francisco (CCSF), Bay Area Water Users Association (BAWUA), CDFG, USFWS, Friends of the Tuolumne (FOTT), and the Tuolumne River Preservation Trust (TRPT). The Turlock Irrigation District is submitting this proposal on behalf of the TRTAC. Additionally, the companion proposal submitted by CDFG to CALFED was developed in cooperation with this proposal, and future planning and implementation will be coordinated among these different parties through the TRTAC.

The Stanislaus County Planning Department (County) has received copies of the *Draft Tuolumne River Corridor Restoration Plan*, and participated, along with City of Modesto Planning staff, in a one-day presentation of the Restoration Plan organized by the TRTAC. In addition, the TID project administration staff for the Gravel Mining Reach and SRP 9/10 restoration projects has worked closely with the County to implement those projects. Attached letters were submitted to Ron Freitas, Director of Stanislaus County Department of Planning, and Ray Simon, Chairman of Stanislaus County Board of Supervisors, formally notifying them of the sediment management project proposal.

Lands adjacent to part of the project reach, including much of floodplain from Old La Grange Bridge downstream to Basso Bridge, are owned primarily by Stanislaus County. CALFED has funded the acquisition of three parcels of land totaling 42 acres between La Grange Bridge and Basso Bridge (Basso Ecological Reserve Land Purchase), that will connect adjacent large tracts on the south bank of County-owned properties.

Private property owners identified will be notified of the project activities once the Sediment Management Plan (Task 1a) is started, and as river access needs are identified.

VIII. COSTS

A. Budget.

The total cost for this project, including project management, planning, and implementation is \$411,400. The proposed budget breakdown for Tasks 1-4 is provided in Table 1. The budget for this project was developed by assessing costs for each task and subtask, and assumes the institutional framework discussed in the project description (TRTAC supervision, TID administration, Consultant implementation). TID imposes indirect costs of 3% of the total costs for project management overhead.

B. Schedule.

The Phase I of sediment augmentation (CDFG Task 2d) is scheduled to begin in August 1999, with the "La Grange Gravel Addition" project. The Sediment Management Plan will be developed during fall and winter of 1999/2000, in time to begin implementing Tasks 2-4 during summer of 2000. Task 2f (CDFG Phase II sediment augmentation) will depend on completion of Tasks 2a-2c, which are necessary preparatory phases for subsequent sediment augmentation. Development and implementation of fine sediment reduction methods (Tasks 3a and 3b) are interdependent and should proceed only after Gasburg Creek watershed remediation (CDFG task 3c) is implemented. Monitoring (Tasks 4a, b and f) will be implemented after Tasks 2 and 3 are complete, Tasks 4c,d and e will be completed as currently scheduled by TRTAC consultants.

Table 2. Estimated costs for each task and the total amount of funding being requested from CALFED.

Task	Service Contracts	Overhead and Indirect Costs	Total Costs
Task 1			
la	\$26,900		
lb	\$20,600		
Task 2			
2a	\$3,500		
2b	\$13,500		
2c	\$14,500		
Task 3			
3a	\$30,700		
3 b	\$104,500		
Task 4			
4a	\$80,000		
4b	\$18,200		
4c	\$10,000		
4 f	\$58,600		
Project Management (3%)		\$11,300	
Contingency (5%)		\$18,900	
TOTAL	\$381,000	\$30,400	\$411,400

IX. COST SHARING

Several components of the project include cost-sharing potential with current TRTAC funding.

The gravel permeability study has received \$56,000 in funding from the TRTAC, and implementation of this program began in November 1998. The additional funding requested for chinook salmon fry emergence studies will complement the permeability studies and incorporates costs saved by using TID/MID fry emergence trap frames.

The gravel quality photo assessment has received \$8,000 in funding from the TID/MID, and implementation of the field component of this program was completed in January 1999. The additional funding requested from CALFED will complement the TRTAC funds.

The project management Task 1a of this proposal includes \$7,200 of funding for database management. The TID/MID will provide an estimated \$10,000 for a systematic evaluation and compilation of past sediment management information generated through previous TID/MID studies. This information will be relevant and useful for this proposed project herein. The project will use the existing EACH model developed by the TID/MID.

X. APPLICANT QUALIFICATIONS

Since 1971, TID, MID, and CCSF have, in cooperation with CDFG and USFWS, monitored river conditions and developed programs that enhance the natural production of fall-run chinook salmon in the Tuolumne River. The project manager for these activities has been TID.

A. TRTAC and Other Local Support for Project

In addition to project management provided by TID, the Tuolumne River Technical Advisory Committee (TRTAC) has management and technical oversight responsibilities for preparing and implementing a river-wide restoration plan and specific restoration projects on the Tuolumne River. The firm of McBain & Trush was retained in 1996 by TID through the TRTAC to develop an integrated, long-term salmon and riparian habitat restoration plan for the Tuolumne River below La Grange Dam. The Restoration Plan developed preliminary designs for specific restoration projects, which have been approved by the TRTAC participants as high priority projects. The TRTAC has selected the Sediment Management Plan as one priority restoration project to be implemented to meet FERC requirements. Other restoration projects currently being implemented on the Tuolumne River include the Gravel Mining Reach (4 Segments) and SRPs 9 and 10.

B. Project Management

The Program Manager is Wilton Fryer, P.E. Mr. Fryer graduated from the University of California at Davis with a BS in Soil & Water Science, an MS in Irrigation Science, and later an ME in Civil Engineering with an emphasis in water resources. He is currently registered as both a Civil Engineer and an Agricultural Engineer. Accomplishments: Development and implementation of the Oakdale Irrigation District Irrigation Master Plan. Directed a \$22 million canal rehabilitation project for OID where 54 miles of dirt canals were replaced with pipe. Development of the OID domestic water service system. Designer and project manager for a replacement water treatment plant for the TID La Grange Domestic Water System.

Tim Ford has been the staff aquatic biologist for TID and MID since 1981. Mr. Ford graduated from the University of California at Davis with BS in Wildlife & Fisheries Biology in 1977. He worked as a Biological Technician for the Angeles, Modoc, Tahoe, and Stanislaus National Forests prior to working for the Districts. Mr. Ford is tasked with planning, coordinating and conducting the aquatic resources program for the Districts, and his responsibilities include field studies, program development, consultant supervision, and coordination with Don Pedro project operations.

TID staff will provide contracting support and financial service support as needed.

C. Consultants

The firm of McBain & Trush, who has performed project conceptual design work, will continue in a lead role to provide oversight of design and implementation of coarse gravel augmentation and monitoring, and fine sediment reduction. McBain & Trush is a professional consulting partnership specializing in applying fluvial geomorphic and ecological research to river management and restoration, particularly in regulated river ecosystems. The principals on this project are Scott McBain, Dr. William Trush. Scott McBain is a hydraulic engineer and fluvial

geomorphologist with an MS in Civil Engineering from the University of California at Berkeley. He specializes in effects of high stream flows on channel morphology, bedload transport, watershed sediment yields, and stream restoration. Dr. William Trush is an adjunct professor in the Humboldt State University Fisheries Department, specializing in anadromous fish ecology, anadromous fish interactions with fluvial geomorphology, channel maintenance flows and hydrology, riparian ecology, and stream restoration and management. He is also Director of the HSU Institute for River Ecosystems.

The firm of Stillwater Sciences will provide the lead role in gravel quality monitoring and eggto-emergence evaluation, co-lead the evaluation of the design and implementation of fine sediment reduction methodologies, and evaluation of ecological benefits of the coarse sediment augmentation program. Stillwater Sciences is a firm of biological, ecological and geological scientists specialized in developing new scientific approaches and technologies for problemsolving in aquatic and terrestrial systems. Its founding members have over fifty years of experience in freshwater ecology, fisheries and wildlife biology, riparian and wetland ecology, entomology, botany, and hillslope and fluvial geomorphology. The principles on this project are Frank Ligon and Jennifer Vick. Frank Ligon is an aquatic ecologist and geomorphologist specializing in investigations of the role of fluvial processes and geomorphology in the ecology of stream fish, invertebrate, and plant communities. He has successfully managed several complex, long-term projects involving watershed analysis, salmon ecology and restoration, geomorphology and riverine ecosystem restoration. Jennifer Vick is an aquatic ecologist and geomorphologist. Her experience ranges from microhabitat partitioning of fishes to geomorphic and hydrologic impacts of dams. Stillwater Sciences is actively involved with the river wide monitoring associated with the Districts' FERC Settlement Agreement.

TUOLUMNE RIVER TECHNICAL ADVISORY COMMITTEE

DON PEDRO PROJECT - FERC LICENSE 2299

Modesto Irrigation District Turlock Irrigation District City & County of San Francisco California Department of Fish & Game U.S. Fish & Wildlife Service



333 East Canal Drive Turlock, CA 95381-0949 Phone: (209) 883-8275 Fax: (209) 656-2143 Email: tjford@tid.org

Wilton Fryer Restoration Program Manager Turlock Irrigation District 333 East Canal Drive Turlock, CA 95381-0949 April 7, 1999

Dear Mr. Fryer:

The Tuolumne River Technical Advisory Committee (TRTAC) is a product of the 1995 Don Pedro Project FERC Settlement Agreement (FSA). The FSA is a precedent-setting document signed by 11 parties representing water agencies, fishery agencies, and environmental groups. The TRTAC is presently engaged in preparing a Habitat Restoration Plan for the 52-mile reach known as the Lower Tuolumne River, from La Grange Dam to the San Joaquin River. The FSA, the habitat plan, and salmon restoration plans developed by both the CDFG and US Fish and Wildlife Service, all recognize the importance of appropriate sediment management and the need for improvements from existing conditions.

The TRTAC supports the proposed sediment management plan and associated projects as developed by McBain and Trush and submitted by you on behalf of the TRTAC. This effort will lead to a reduction in fine sediments and an increase in coarse sediments to improve salmon spawning and incubation conditions in the Tuolumne River. The TRTAC believes this sediment management plan represents an important restoration action consistent with the draft Habitat Restoration Plan and will complement other restoration projects that are underway in the Tuolumne River corridor.

Authorized by and signed on behalf of the TRTAC,

Tim Ford

Coordinator, TRTAC

Tim Ford

Turlock and Modesto Irrigation Districts

George Neillands

California Department of Fish and Game

Susan Boring

U. S. Fish and Wildlife Service

Ron Yoshiyama

City and County of San Francisco

Tim Ramirez Tuolumne River Preservation Trust

John Farnkopf

Bay Area Water Users Association

Dave Boucher

Friends of the Tuolumne

CC: TRTAC distribution



Ron Freitas, Director Stanislaus County Dept. of Planning 1100 H St., 2nd Floor Modesto, CA 95354

RE: Salmon Habitat Restoration Sediment Management Projects

Dear Mr. Freitas,

The CALFED Bay-Delta Program has developed a Proposal Solicitation Package for funding Ecosystem Restoration Projects and Programs in 1999 and 2000. The Turlock and Modesto Irrigation Districts have been actively working on several fall-run salmon habitat restoration projects along the Tuolumne River since 1997. The TID is the program manager for these projects and coordinator for the Tuolumne River Technical Advisory Committee, TRTAC, which oversees the development of the projects.

This letter is a formal notice on behalf of the TRTAC, that the TID will be submitting a sediment management proposal to CALFED for funding. The project location will be in the prime spawning reach of the river from River Mile 51.6 to 47.9 starting below the old La Grange Bridge. The first phase will involve identification of added sites for spawning gravel reintroduction. The next phase will be development of a method to remove fine sand that has degraded the existing spawning habitat, followed by methods to reduce future fine sediment from degrading the cleaned channel. These tasks will involve access across State and County lands

The project represents the next phase in implementing restoration actions outlined in the draft Habitat Restoration Plan provided to the Planning Department staff in the fall of 1998. This project will expand upon the re-introduction of spawning sized gravel that Department of Fish & Game will conduct downstream of the old La Grange Bridge staring this summer. Currently CALFED has funded the first CDFG project.

If you have any questions please call me at 2029-883-8316.

Sincerely,

TURLOCK IRRIGATION DISTRICT

Wilton B. Fryer, P.E.

Water Planning Department Manager

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GS0910-03



Ray Simon, Chairman Stanislaus County Board of Supervisors 1100 H St., 2nd Floor Modesto, CA 95354

RE: Salmon Habitat Restoration Sediment Management Projects

Dear Mr. Simon,

The CALFED Bay-Delta Program has developed a Proposal Solicitation Package for funding Ecosystem Restoration Projects and Programs in 1999 and 2000. The Turlock and Modesto Irrigation Districts have been actively working on several fall-run salmon habitat restoration projects along the Tuolumne River since 1997. The TID is the program manager for these projects and coordinator for the Tuolumne River Technical Advisory Committee, TRTAC, which oversees the development of the projects.

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Sincerely,

TURLOCK IRRIGATION DISTRICT

Wilton B. Fryer, P.E.

Water Planning Department Manager

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GS0910-03

State of California The Resources Agency Department of Water Resources

Agreement No	
Exhibit	

NONCOLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID FOR PUBLIC WORKS

STATE OF CALIFORNIA)
COUNTY OF Stanis aus)
Wilton B Ryer , being first duly sworn, deposes and
says that he or she is Water Planning Dept. Manager of
(position title) Turlock lunigation District (the bidder)
(the bidder)
the party making the foregoing bid that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.
DATED: 14 Apr 99 By Willem B Giver (person signing for bidder)
DIANE R. PICKERING Convinission 1074256 Notary Public — Collitorale Stanistous County

(Notarial Seal)

(Notary Public)

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Standard Form 424A (Rev. 4-92) Prescribed by OMB Circular A-102

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Standard Form 424A (Rev. 4-92) Page 2

ASSURANCES - NON-CONSTRUCTION PROGRAMS

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0040), Washington, DC 20503.

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

- 1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.
- Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
- Will establish safeguards to prohibit emproyees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
- Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
- Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prascribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of QPM's Standards for a Merit System of Personnel Administration (5 C.F.A. 900, Subpart F).
- 6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1984 (P.L. 88-362) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1851-1883, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation

- Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Disorimination Act of 1975, as amended (42) U.S.C. §§8101-6107), which prohibits discrimination on the basis of age; (a) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse: (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. St-816), as amended, relating to nondiscrimination on the basis of alcohol abuse or elcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 F S), as amended, relating to confidentiality of alcoh. and drug abuse patient records; (h) Title VIII) of the Civil Rights Act of 1958 (42 U.S.C. §§3601 et sec.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondisorimination statute(s) which may apply to the apolication.
- 7. Will comply, or has already compiled, with the requirements of Titles !! and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-846) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
- Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1301-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

- Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §\$276a to 276a-7), the Copeland Act (40 U.S.C. §276a and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §\$227-333), regarding labor standards for federally-assisted construction subadreements.
- 10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 89-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and aggustition is \$10,000 or more.
- 11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1989 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EQ 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Mahagement Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. \$\$7401 et seq.); (a) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-

- 12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
- 13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.O. §470), EQ 11893 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §\$489a-1 et seq.).
- 14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.
- 15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-644, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.
- 16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
- 17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Prof Organizations."
- Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies poverning this program.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL.	Water Honning Depl. Mgr.		
APPLICANT ORGANIZATION Turlock Irrigation District	DATE SUBMITTED 15 Apr 99		

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